

# STAND-UP MRI & DIAGNOSTIC CENTER

## UPRIGHT® MRI & 3.0T WIDE-BORE MRI

Accredited by the American College of Radiology

**PATIENT NAME:** HUMINSKI, SCOTT  
**DOB:** 01-Dec-1959  
**PATIENT NUMBER:** F10249378  
**REFERRING PHYS:** MARTIN, REBECCA J  
**DATE OF SERVICE:** 03-Apr-2024 07:12:35 AM

### **DTI 3D TRACTOGRAPHY OF THE BRAIN WITHOUT CONTRAST:**

**HISTORY:** Pain toward the back of the head with neck tingling following motor vehicle collision 08/22/2023.

**COMPARISON:** Prior examination from 03/05/2024.

**TECHNIQUE:** Multisequence T1 and T2 weighted images were obtained. Susceptibility weighted imaging (SWI) was also obtained. Neuro quantitative analysis was performed for evaluation of brain atrophy.

### **FINDINGS:**

**SUPRATENTORIAL STRUCTURES:** There are multiple stable subcortical foci of T2 hyperintensity seen within both cerebral hemispheres. There is no evidence for a mass, fluid collection, or hemorrhage. The basal ganglia are within normal limits.

**POSTERIOR FOSSA:** The brainstem is normal in signal intensity. The cerebellum appears within normal limits. The cerebellar folia and sulci are unremarkable. The internal auditory canals appear within normal limits. The seventh and eighth cranial nerves are normal and there is no evidence for cerebellopontine angle mass.

**VENTRICULAR SYSTEM:** The ventricles are normal in size and shape. There is no evidence for hydrocephalus and there is no evidence for transependymal flow of CSF.

**SKULL BASE AND OSSEOUS STRUCTURES:** There is trace ethmoid and maxillary sinus mucosal thickening. The orbits and temporal bones are within normal limits.

**VASCULAR STRUCTURES:** There is normal signal void within the major vessels of the circle of Willis. The superior sagittal sinus appears unremarkable on this examination.

**PITUITARY AND SELLA:** There is no evidence for mass.

**DIFFUSION IMAGING:** There are no signal abnormalities of an acute ischemic process. There is no evidence for acute small vessel ischemia.

**SUSCEPTIBILITY WEIGHTED IMAGING (SWI):** Susceptibility weighted images demonstrate no areas of signal dropout to suggest residual blood products.

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DIFFUSION TENSOR IMAGING (DTI): Whole brain analysis demonstrates visible reductions in fractional anisotropy which correspond with areas of abnormal signal seen on the standard MRI images. This finding is seen in groups of patients that are diagnosed with white matter injury; therefore, clinical correlation is recommended to confirm the diagnosis of traumatic brain injury in this patient. Quantitative regional analysis through the corpus callosum was performed. FA value within the genu of the corpus callosum is 0.5676 which is more than two standard deviations below the mean of 0.853 (SD 0.04). This is abnormal and indicative of axonal injury. Evaluate clinically.

NEUROQUANT ANALYSIS: Analysis of brain volumes was performed. The left hippocampus measures 3.35 cubic centimeters and the right hippocampus measures 3.55 cubic centimeters. There is volume loss involving the left middle temporal gyrus of the temporal lobe.

### IMPRESSION:

1. There are multiple stable subcortical foci of T2 hyperintensity seen within both cerebral hemispheres. **See figure 1, image 20, series 16** with the arrows pointing to subcortical foci of T2 hyperintensity. Additional foci are seen, as well. Given the patient's history, these findings are suspicious for posttraumatic brain injury. Differential considerations include stroke/small vessel ischemic change and demyelinating condition, such as multiple sclerosis, amongst other causes and/or a combination of these causes. Correlate clinically to confirm the diagnosis of traumatic brain injury in this patient.
2. Whole brain analysis demonstrates visible reductions in fractional anisotropy which correspond with areas of abnormal signal seen on the standard MRI images. This finding is seen in groups of patients that are diagnosed with white matter injury; therefore, clinical correlation is recommended to confirm the diagnosis of traumatic brain injury in this patient. Quantitative regional analysis through the corpus callosum was performed. FA value within the genu of the corpus callosum is 0.5676 which is more than two standard deviations below the mean of 0.853 (SD 0.04). This is abnormal and indicative of axonal injury. Evaluate clinically.
3. Analysis of brain volumes was performed. There is volume loss involving the left middle temporal gyrus of the temporal lobe. Given the patient's, the finding is suspicious for posttraumatic atrophy. If there is further concern for developing posttraumatic atrophy, a follow-up MRI of the brain with NeuroQuant in six months would be helpful for evaluation of interval changes.
4. There is trace ethmoid and maxillary sinus mucosal thickening.

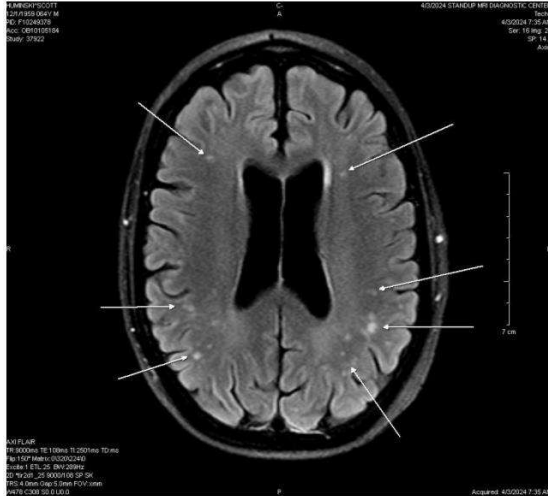
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FIGURE 1



The definitions and normal values used in this report are based on measurements from the following published medical articles: (1) Brander A, et al. Diffusion Tensor Imaging of the Brain in a Health Adult Population: Normative Values and Measurement Reproducibility at 3 T and 1.5 T, ACTA RADIOLOGICA, 2010; 51(7): 800-807; and (2) Kotian RP, et al. Consistency of Fractional Anisotropy Values Using Different Combinations of b-Value and Time of Echo (TE) in Diffusion Tensor Imaging of Normal Brain White Matter, Journal of Clinical and Diagnostic Research, 2018; Dec, Vol-12(12): TC-1-TC04.

Thank you for your kind referral.

**SHAHIN J. KORANGY, M.D.**  
**FELLOWSHIP TRAINED, NEURORADIOLOGY**  
**CERTIFIED, AMERICAN BOARD OF RADIOLOGY**

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